

**Amendments to the Claims**

This listing of the claims will replace all prior versions, and listings, of claims in this application.

Claims 1–15 (cancelled).

Claim 16 (currently amended): A method for preparing a composite cathode active material for a lithium secondary battery, the method comprising:

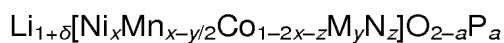
producing a first lithium metal composite oxide in a reactor by (a) precipitating a first metal composite hydroxide from a first mixture of a first metal precursor, a first aqueous ammonia solution and a first basic solution, and (b) mixing and reacting the first metal composite hydroxide with a first lithium precursor to form the first lithium metal composite oxide;

producing, separately from the first lithium metal composite oxide, a second lithium metal composite oxide by (a) precipitating a second metal composite hydroxide from a second mixture of a second metal precursor, a second aqueous ammonia solution and a second basic solution, and (b) mixing and reacting the second metal composite hydroxide with a second lithium precursor to form the second lithium metal composite oxide; and

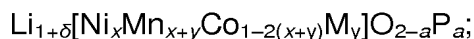
after separately producing the first and second lithium metal composite oxides, mixing the first and second lithium metal composite oxides to form a composite cathode active material for a lithium secondary battery, wherein

the first lithium metal composite oxide has a mean particle diameter that is less than 90% of a mean particle diameter of the second lithium metal composite oxide;

the first and second lithium metal composite oxides have a formula selected from the group consisting of



and



M is selected from the group consisting of Mg, Zn, Ca, Sr, Cu and Zr;

N is selected from the group consisting of Fe, Al, Ga, In, Cr, Ge and Sn;

P is selected from the group consisting of F and S;

$\delta$  has a value such that  $-1/10 \leq \delta \leq 1/10$ ;

$x$  has a value such that  $0 \leq x \leq 1$ ;

$y$  has a value such that  $0 \leq y \leq 1/10$ ;

$z$  has a value such that  $0 \leq z \leq 1/10$ ; and

$a$  has a value such that  $0 \leq a \leq 0.3$ .

Claim 17 (previously presented): The method of Claim 16, wherein:

at least one of the first and second lithium metal composite oxides comprise a primary particle having a particle diameter distribution between about 0.1  $\mu\text{m}$  and about 0.2  $\mu\text{m}$ , and a secondary particle having a mean particle diameter distribution between about 1  $\mu\text{m}$  and about 20  $\mu\text{m}$  when the primary particles are aggregated to form the secondary particles.

Claim 18 (previously presented): The method of Claim 16, wherein the composite cathode active material comprises about 5 wt% to about 40 wt% of the first lithium metal composite oxide.

Claim 19 (previously presented): The method of Claim 16, wherein the first lithium metal composite oxide has the same chemical composition as the second lithium metal composite oxide.

Claim 20 (currently amended): The method of Claim 16, wherein—in the composite cathode active material comprises at least two of nickel ~~having~~—has an oxidation value of 2.0, manganese having—has an oxidation value of 4.0, and cobalt having—has an oxidation value of 3.0.

Claim 21 (previously presented): The method of Claim 16, wherein the first and second mixtures are exposed to ultrasonic energy.

Claim 22 (previously presented): The method of Claim 16, wherein:

the first metal precursor comprises a first aqueous metal solution containing more than two metal salts; and

the second metal precursor comprises a second aqueous metal solution containing more than two metal salts.

Claim 23 (previously presented): The method of Claim 16, wherein:

the first metal precursor comprises a first aqueous metal solution containing more than two metal salts;

the first aqueous ammonia solution has a concentration that is between about 0.2 and about 0.3 times a concentration of the first aqueous metal solution;

the second metal precursor comprises a second aqueous metal solution containing more than two metal salts; and

the second aqueous ammonia solution has a concentration that is between about 0.2 and about 0.3 times a concentration of the second aqueous metal solution.

Claim 24 (previously presented): The method of Claim 16, wherein the first and second mixtures each have a pH that is between about 11.0 and about 11.5.

Claim 25 (previously presented): The method of Claim 16, further comprising exposing the first and second lithium metal composite oxides to a chelating agent, wherein the chelating agent is selected from the group consisting of citric acid, stannic acid, glycolic acid and maleic acid.

Claim 26 (previously presented): The method of Claim 16, wherein:

the first and second metal precursors have the same chemical composition;

the first and second aqueous ammonia solutions have the same chemical composition;

the first and second basic solutions have the same chemical composition; and

the first and second lithium precursors have the same chemical composition.

Claim 27 (previously presented): A method for preparing a composite cathode active material for a lithium secondary battery, the method comprising:

producing a first lithium metal composite oxide by (a) precipitating a first metal composite hydroxide from a first mixture of a first metal precursor, a first aqueous ammonia solution and a first basic solution, and (b) mixing and reacting the first metal composite hydroxide with a first lithium precursor to form the first lithium metal composite oxide;

producing a second lithium metal composite oxide by (a) precipitating a second metal composite hydroxide from a second mixture of a second metal precursor, a second aqueous ammonia solution and a second basic solution, and (b) mixing and reacting the second metal composite hydroxide with a second lithium precursor to form the second lithium metal composite oxide; and

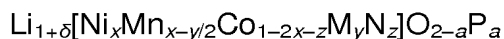
mixing the first and second lithium metal composite oxides to form a composite cathode active material for a lithium secondary battery; wherein

the first lithium metal composite oxide has a mean particle diameter that is less than 90% of a mean particle diameter of the second lithium metal composite oxide;

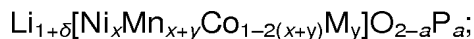
the first lithium metal composite oxide has a formula



the second lithium metal composite oxide has a formula selected from the group consisting of



and



M is selected from the group consisting of Mg, Zn, Ca, Sr, Cu and Zr;

M' is selected from the group consisting of Al, Mg, Zr and Ti;

N is selected from the group consisting of Fe, Al, Ga, In, Cr, Ge and Sn;

P is selected from the group consisting of F and S;

$\delta$  has a value such that  $-1/10 \leq \delta \leq 1/10$ ;

x has a value such that  $0 \leq x \leq 1$ ;

x' has a value such that  $x' \leq 1/10$ ;

y has a value such that  $0 \leq y \leq 1/10$ ;

z has a value such that  $0 \leq z \leq 1/10$ ; and

a has a value such that  $0 \leq a \leq 0.3$ .

Claim 28 (previously presented): The method of Claim 27, wherein the first and second mixtures are exposed to ultrasonic energy.

Claim 29 (currently amended): ~~The method of Claim 16, wherein:~~ A method for preparing a composite cathode active material for a lithium secondary battery, the method comprising:

producing a first lithium metal composite oxide in a reactor by (a) precipitating a first metal composite hydroxide from a first mixture of a first metal precursor, a first aqueous ammonia solution and a first basic solution, and (b) mixing and reacting the first metal composite hydroxide with a first lithium precursor to form the first lithium metal composite oxide;

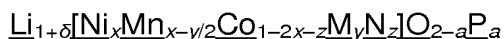
producing, separately from the first lithium metal composite oxide, a second lithium metal composite oxide by (a) precipitating a second metal composite hydroxide from a second mixture of a second metal precursor, a second aqueous ammonia solution and a second basic solution, and (b) mixing

and reacting the second metal composite hydroxide with a second lithium precursor to form the second lithium metal composite oxide; and

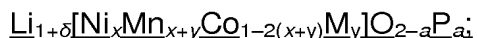
after separately producing the first and second lithium metal composite oxides, mixing the first and second lithium metal composite oxides to form a composite cathode active material for a lithium secondary battery, wherein

the first lithium metal composite oxide has a mean particle diameter that is less than 90% of a mean particle diameter of the second lithium metal composite oxide;

the first and second lithium metal composite oxides have a formula selected from the group consisting of



and



M is selected from the group consisting of Mg, Zn, Ca, Sr, Cu and Zr;

N is selected from the group consisting of Fe, Al, Ga, In, Cr, Ge and Sn;

P is selected from the group consisting of F and S;

$\delta$  has a value such that  $-1/10 \leq \delta \leq 1/10$ ;

$x$  has a value such that  $0 \leq x \leq 1$ ;

$y$  has a value such that  $0 \leq y \leq 1/10$ ;

$z$  has a value such that  $0 \leq z \leq 1/10$ ;

$a$  has a value such that  $0 \leq a \leq 0.3$ ;

the reactor includes an agitator having a first set of ~~has a structure in which~~ rotary vanes designed to induce fluid flow in a first direction and a second set of rotary vanes designed to induce fluid flow in a second direction that is reverse from the first direction; ~~vane type,~~ and

the reactor further includes a plurality of baffles that are spaced apart from ~~an~~ the inner wall of the reactor, ~~have the baffles~~ having a shape of a flat panel and ~~are being~~ attached to the inner wall by a plurality of connecting rods.